

4.8 NOISE

Based on the findings of the IS, the proposed West Gateway project may or would result in potentially significant adverse impacts on sensitive receptors and the noise environment which could exceed standard, specifically related to the construction of the project. The analysis in the following sections focuses on the existing conditions in the study area, the analysis methodology, thresholds of significance, the potential population and housing impacts of the West Gateway project related to construction noise, and mitigation as needed.

4.8.1 ENVIRONMENTAL SETTING

4.8.1.1 Noise Descriptors

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perceptibility is subjective and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as “noisiness” or “loudness.” Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB).

The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighting filter system is used to adjust measured sound levels. When sound is measured for distinct time intervals, the statistical distribution of the overall sound level can be obtained during that period. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with such measurements. The L_{eq} metric is a single-number noise descriptor which represents the average sound level over a given period of time. Table 4.8-1 presents the subjective effect of changes in the sound pressure levels. To provide some perspective on the relative loudness of noise levels, Table 4.8-2 lists common sources of noise and their approximate noise levels.

**TABLE 4.8-1
CHANGE IN SOUND PRESSURE LEVEL**

Change in Apparent Loudness	
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Engineering Noise Control, Bies and Hansen, 1988

To account for the increased sensitivity of people to noise occurring at night, a number of noise metrics have been developed. Two of the more commonly used metrics are the Day-Night Sound Level (L_{dn}) and the Community Noise Equivalent Level (CNEL). The L_{dn} , which was developed by the United States Environmental Protection Agency, is a 24-hour average sound level (similar to a 24-hour L_{eq}) in which a 10 dB penalty is added to any sounds occurring between the hours of 10:00 P.M. and 7:00 A.M. The CNEL, which was developed for use in the California Airport Noise Regulations, is similar to the L_{dn} except that a 5 dB penalty is also added for noise occurring during evening hours from 7:00 P.M. to 10:00 P.M. Thus, both L_{dn} and CNEL noise

metrics provide 24-hour averages of A-weighted noise levels at a particular location; the distinction is that L_{dn} includes a nighttime adjustment while the CNEL metric includes both an evening and a nighttime adjustment. For noise generated from vehicle traffic, CNEL and L_{dn} could be used interchangeably because noise levels would generally differ between the two noise descriptors by less than 1 dB.

**TABLE 4.8-2
TYPICAL NOISE LEVELS**

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1000 ft		
	100	
Gas Lawn Mower at 3 ft		
	90	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 3 ft
	80	Garbage Disposal at 3 ft
Noisy Urban Area, Daytime		
Gas Lawn Mower at 3 ft	70	Vacuum Cleaner at 10 ft
Commercial Area		Normal speech at 3 ft
Heavy Traffic at 300 ft	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (back ground)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Table N-2136.2 of California Department of Transportation's Traffic Noise Analysis Protocol, October 1998.

4.8.1.2 Sensitive Receptors

Some population groups, such as children and the elderly, are considered more sensitive to noise than others. Sensitive land uses in the vicinity of the project site include the Cesar Chavez Elementary School to the west of the site, and various other residential uses bordering the majority of the north and east perimeters of the project site.

4.8.2 REGULATORY SETTING FOR NOISE

Federal and state agencies have established noise/land use compatibility guidelines. These guidelines, described in the following paragraphs and tables, are all based upon cumulative noise criteria such as L_{eq} , CNEL and L_{dn} .

The City of Long Beach has established noise limits through the noise ordinances in the Municipal Code and noise standards in the Noise Element of the General Plan. Noise limits generally restrict noise levels based on the type of noise source (e.g. amplified speakers) or land use. These noise limits are designed to maintain the quality of life for noise sensitive land uses such as residential, hospitals, and schools. To this end, the City has established limits on magnitude and duration of noise. The following table generally applies to point sources of noise. Sound level limits based on land use types established by the City are detailed in Table 4.8-3 below.

**TABLE 4.8-3
CITY OF LONG BEACH INTERIOR NOISE LEVEL LIMITS**

Land Use	Time	Allowable Interior Noise Level (dBA)
Residential	10 p.m. to 7 a.m.	35
	7 a.m. to 10 p.m.	45
School	7 a.m. to 10 p.m. (while school is in session)	45
Hospital, designated quiet zones and noise sensitive zones	Anytime	40

Source: City of Long Beach Municipal Code Section 8.80.170.

It is unlawful for any person at any location within the City of Long Beach to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other residential property to exceed:

1. The noise standard for that land use district as specified in Table 4.8-4 in Section 8.80.160 for a cumulative period of more than thirty minutes in any hour; or
2. The noise standard plus five dB(A) for a cumulative period of more than fifteen minutes in any hour; or
3. The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or
4. The noise standard plus fifteen dB(A) for a cumulative period of more than one minute in any hour; or
5. The noise standard plus twenty dB(A) or the maximum measured ambient, for any period of time.

In the event the ambient noise level exceeds any of the first four noise limit categories, designated in the above, the allowable noise exposure standard would be increased in five decibel increments in each category as appropriate to encompass or reflect the ambient noise level. In the event that ambient noise level exceeds the fifth noise limit category, as designated above, the maximum allowable noise level under category five would be increased to reflect the maximum ambient noise level.

In the event that offensive noise contains a steady audible tone, such as a whine, screech, or hum, or is a repetitive noise such as hammering, the standard limits set in Table 4.8-4 would be reduced by five decibels. Parcels 7 and 11 are located in District Two. All other parcels appear to be designated as being in District One.

**TABLE 4.8-4
CITY OF LONG BEACH EXTERIOR NOISE LEVEL LIMITS**

Receiving Land Use District	Time Period	Noise Level (dBA)
District One ¹	Night: 10 p.m. to 7 a.m.	45
	Day: 7 a.m. to 10 p.m.	50
District Two ²	Night: 10 p.m. to 7 a.m.	55
	Day: 7 a.m. to 10 p.m.	60
District Three ³	Anytime	65
District Four ³	Anytime	70
District Five ⁴	Regulated by other agencies and laws	

Source: City of Long Beach Municipal Code Section 8.80.160.

Note:

1 District One is predominately residential with other land use types also present.

2 District Two is predominately commercial with other land uses types also present.

3 Districts Three and Four are predominantly industrial with other land use types also present. Districts Three and Four limits are intended primary of use at their boundaries rather than for noise control within those districts.

4 District Five includes airports, freeways and waterways regulated by other agencies.

4.8.3 METHODOLOGY RELATED TO NOISE/VIBRATION

The analysis of impacts related to noise considers the impacts of the project site on the surrounding environment. Both construction and operational aspects are examined for this evaluation. Based on the City of Long Beach Noise Ordinance, if a project would likely cause sound in violation of Chapter 8.80 (Noise) and which are subject to mandatory review or approval by departments or agencies having jurisdiction in the City, or which under the environmental review process are judged to be likely to violate these regulations:

- Review to determine compliance with the intent and provisions of Chapter 8.80.
- Recommend sound analysis which identifies existing and projected noise sources and associated sound levels.
- Recommend usage of adequate measures to avoid violation of any provision of Chapter 8.80.

Noise and vibration from construction activities were calculated based on methodology found in the United States Department of Transportation (USDOT) *Transit Noise and Vibration Impact Assessment*. Noise and vibration due to construction activities were evaluated from significance criteria from the aforementioned USDOT document as well as City criterion. Noise from the operation of the project was qualitatively addressed based on the quantity of traffic that is required for a discernable change in noise levels.

4.8.4 PROJECT RELATED NOISE AND VIBRATION

The proposed project has the potential to generate noise and vibration from the construction and operational phases of the project. Construction of the proposed project would generate noise and vibration from the use of construction equipment during the development of the project. Construction activities associated with the development of the project would result in construction noise to the institutional land uses bordering the project site. Noise increases produced from the operation of the project would result from the use of air conditioning units as well as additional project-related vehicle trips.

4.8.4.1 Construction Noise

Construction activities would occur adjacent to institutional uses located in close proximity to the project site. The total construction duration is approximately 24 months for Parcels 9, 10 and 11, and less than 24 months for Parcels 2 through 7 as the construction schedules are expected to be variable as each Parcel may be separately developed. The City of Long Beach Ordinance (Section No. 8.80.202) states that “no person shall operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling demolition or any other related building activity which produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity between the hours of 7:00 p.m. and 7:00 a.m. the following day on weekdays.” Construction work is permitted weekdays between 7:00 a.m. and 7:00 p.m. p.m., on Saturdays between the hours of 9:00 a.m. 6:00 p.m., and prohibited on Sundays. Construction activities would occur within the allowable hours specified in the municipal code and are exempt from the statutes of the code because, though the City of Long Beach recognizes that construction noise is a nuisance, it is an inevitable part of construction activities which is necessary for development. The City of Long Beach also recognizes that construction activities are generally short-term and noise from these activities would cease subsequent to project build-out. As such, the Municipal Code exempts construction noise by relegating construction activity to the least noise sensitive portions of the day. Consequently, construction related noise is not considered to result in a significant adverse noise impact.

4.8.4.2 Construction Vibration

Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and the construction equipment. Operation of construction equipment generates vibrations which spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies; depending on soil type, ground strata, and receptor building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. Ground vibrations from construction activities rarely reach the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site.

Based on procedures established by the Federal Transit Administration (FTA) manual, RMS vibration velocities from construction equipment operations are expected to range from 0.013 to

0.0005 inch per second (48 to 76 VdB). Ground vibration may be perceptible but would not be expected to exceed the vibration criteria established for institutional buildings during the various periods of the construction operation. Demolition and construction activities would at times occur less than 50 feet from the closest non-project structure. Table 4.8-5, below, lists the estimated range in ground vibration levels that would be expected during construction.

**TABLE 4.8-5
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT**

Equipment	Approximate Velocity Level at reference distance of 25 ft, VdB	Approximate RMS^a Velocity at reference distance of 25 ft inch/second	Approximate Velocity Level at 80 ft to nearest structure, VdB	Approximate RMS^a Velocity at 80 ft to nearest structure, inch/second
Backhoe (small bulldozer)	58	0.003	48	0.0005
Backhoe with a hydraulic hammer attachment (jackhammer)	79	0.035	69	0.0061
Loaded trucks	86	0.076	76	0.0133

Source: P&D Environmental, July 2003

Note:^a RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second.

As described in Table 4.8-5, levels of vibration produced by construction equipment will not exceed U.S. Department of Transportation's (USDOT) vibration significance threshold of 83 VdB for institutional uses. The RMS velocity produced by construction activities will also not exceed the USDOT's significance threshold of 0.20 in/sec for fragile structures. As such, construction activities would not result in significant vibration impacts to local institutional and residential structures.

4.8.4.3 Project Related Traffic Noise

Potential noise impacts from traffic generated noise are evaluated in relation to changes in the noise environment as a result of the proposed project. The proposed project would result in additional vehicle trips traveling to and from the project site. According to the West Gateway Area Traffic Impact Report (Meyer, Mohaddes Associates, November 2004), the project would not significantly impact any of the 36 study intersections analyzed. The poor operation conditions at three of the currently unsignalized intersections would be mitigated by the installation of traffic signals at those intersections. Without signalization at those locations, the unsignalized intersections of Broadway and Maine Avenue and 3rd Street and Daisy Avenue would experience significant delay. This increase in traffic noise due to the proposed project would not be perceptible to human hearing. Generally, a net change of 3 decibels is required for a human to detect a change in noise levels. Because the proposed project would not result in a discernable

change in noise levels after the installation of traffic signals, the proposed project would not result in a significant noise impact during the operation of the project.

4.8.4.4 Project Related Noise From Proposed Land Uses

The introduction of new commercial and residential development would lead to the introduction of new sources of stationary noises on the project site. These long term sources would include equipment and appliances within commercial and retail structures, mowers and leaf blowers, public gatherings, loading and unloading activities and other maintenance and operational activities. Noise produced from operation of the proposed project would also include on site noise sources such as found in heating, ventilation and air conditioning (HVAC) units. HVAC units and other equipment will be acoustically engineered with mufflers and barriers to ensure that no violation of the City's noise standards would occur. Compliance with the City's Noise Ordinance and Title 24 of the State Healthy and Safety Code would prevent impacts on adjacent land uses.

4.8.4.5 Project Related Vibration

The proposed project is mixed residential and retail use which would not involve equipment or vehicles which would result in substantial levels of vibration to nearby uses. Due to the lack of vibration generating machinery associated with the project, the project would not result in significant vibration impacts.

4.8.5 MITIGATION MEASURES RELATED TO NOISE

4.8.5.1 Construction Noise

It is assumed that the project will be required to conduct all operations (construction and operation) in accordance with established City of Long Beach's Noise Ordinance. The following measures are above adherence to existing codes.

For Parcels 2 through 11.

- N-1 All construction equipment shall be in proper operating condition and fitted with standard factory noise attenuation features. All equipment shall be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.
- N-2 Approved haul routes shall be used to minimize exposure of sensitive receptors to potential adverse noise levels from hauling operations.
- N-3 To the degree feasible, construction equipment shall be sited away from adjacent residential land uses to the extent feasible.
- N-4 The City of Long Beach Noise Ordinance (Section No. 8.80.202) states that noise sources associated with construction activities where a building or other related permit is required do not take place between the hours of 7:00 p.m. and 7:00 a.m. the following day on

weekdays or a federal holiday (except for emergency work authorized by the building official), between the hours of 7:00 p.m. on Friday and 9:00 a.m. on Saturday and after 6:00 p.m. on Saturday (except for emergency work authorized by the building official), or at any time on Sunday.

4.8.5.2 Operational Exterior Noise

Even though the operation of the proposed West Gateway project will not result in significant adverse noise impacts, the following mitigation measure is designed to reduce noise levels associated with mechanical equipment. In addition, the operation of the proposed project will be required to comply with City of Long Beach Ordinances related to noise control during operations.

- N-5 Mechanical equipment shall be sufficiently enclosed or muffled and maintained so that noise generated by the operation of this equipment does not exceed the applicable City noise standard causing a noise disturbance (based on City of Long Beach Noise Ordinance, Section No. 8.80.200).

4.8.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION RELATED TO NOISE

After implementation of the feasible mitigation measures described above and compliance with the limited hours for construction activities, noise produced from construction activities would be confined to the least noise sensitive parts of the day and would be limited of limited duration. Following completion of construction activities, construction related noise would cease. As such, due to the short duration and the limitation of noise intensive construction activities to the daytime hours, noise from construction activities is not considered to result in a significant adverse noise impact.

In the operational phase, the project would result in noise generated by project related vehicle traffic and on site equipment and other on site noise sources. These sources of noise were not found to result in significant change in noise levels during project operations. Therefore, the proposed West Gateway project will not result in significant adverse noise impacts in the long term.